REMARKS

Claims 1, 3, 5, 11, 16-18, 20, 25-37 and 39-47 are in this application and are presented for consideration. By this Amendment, Applicant has canceled claim 38. Applicant has also amended claims 16, 20 and 28 to attend to minor informalities. Applicant has amended claim 26 to provide that the hollow elastic tubes extends in parallel with the electrode holding belt. It is Applicant's position that no new issues have been presented.

Claims 26-47 have been rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The Office Action states that the specification does not provide for any disclosure of the specific length of the electrode feed lines.

Applicant respectfully traverses the rejection. Paragraph [0054] of the specification states:

> For strain relief of the electrode feed lines 63, the latter are folded within the middle strand 76 in a triangular, loop-like or meandering pattern, as can be determined from Figure 13.

One of ordinary skill in the art would understand that by looking at Figure 13 of the disclosure that the meandering or loop-like pattern of the electrode feed lines between the electrodes would result in a length that is greater than the length of the elastic tubes in a non stretched state. It can be appreciated that the meandering or loop-like pattern will have a feed line length that is greater than a straight or direct path. The tube has a direct path. One of ordinary skill in the art would inherently know that folding an electrode line in a loop-like pattern would result in a length that is greater than a tube that is not folded at all. As such, it is Applicant's

position that claim 26 contains subject matter that is sufficiently described in the specification in such a way as to reasonably convey to one skilled in the art that Applicant had possession of the claimed invention.

Claim 38 has been objected to under 37 CFR 1.75© as being of improper dependent form for failing to further limit the subject matter of the previous claim. Applicant has canceled claim 38.

Claims 1, 3, 5, 16-18 and 25 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hoch (US 5,313,952) in view of Hallon et al. (US 4,751,928).

The present invention relates to an electrode belt for electrical impedance tomography. The electrode belt comprises a belt material. Sixteen (16) or more electrodes are on the belt material. The belt material is elastic in some sections so that the electrode belt fully surrounds a test subject to be examined over the circumference of the body. The fact that the belt material is elastic in some sections advantageously allows for a comfortable fit of the belt around the circumference of the test subject's body. The present invention further comprises electrode feed lines. The electrode feed lines are integrated within the belt material. This advantageously allows for an orderly positioning of electrodes. However tube feed lines are in a stretchable structure. More electrodes can be easily connected to the belt so that there is an improvement in the imaging and monitoring process. This also avoids the problem of having a tangled mess of wire, which allows for a more comfortable test experience for the test subject. The present invention also includes an external feed line. The electrode feed line is connected to the external feed line at one or more feed points along the belt material. This advantageously unites the

electrode feed lines at a central point in order to establish one or more connection points to an external feed line. This advantageously avoids a tangled wire mess since each electrode does not have to be individually connected by a feed line. The prior art as a whole fails to provide such features or advantages.

The present invention solves the problem of providing a stretchable electrode holding belt that fits comfortably around the circumference of a test subject's body. The prior art as a whole fails to deal with the problem of feed lines in a stretchable structure. Applicant has discovered that integrating electrode feed lines within the belt material and providing feed lines in a stretchable structure provides significant advantages for set up and use. The present invention advantageously provides more comfort to the test subject while sampling a greater area of the test subject. The prior art as a whole fails to surround the circumference of a patient, which disadvantageously leads to less accurate results and a poorer sampling of readings. In particular, Hallon et al. discloses a fastening belt that merely lays across the chest of a patient and fails to address the problem of feed lines in a stretchable structure. Hoch also merely discloses a belt, but fails to provide the advantage of feed lines in a stretchable structure as in the present invention. The prior art as a whole merely covers patches of areas of a patient's body and fails to fully surround the circumference of the patient's body, which disadvantageously leads to less accurate results. The feed lines in a stretchable structure of the present invention advantageously makes it easier for a patient to attach without having to individually connected each electrode. The prior art as a whole fails to provide such advantages as to use and set up.

Hoch discloses an electrode belt assembly having a web belt 12 and an electrode pad assembly 14. The electrode pad assembly 14 has an electrode disk pad 16 and a lead probe assembly 18 that connects to the disk pad 16. The web belt 12 comprises an elongated foam material strip 20 sandwiched between an inner cloth backing strip 22 and an outer cloth backing strip 24. Apertures 26 are spaced evenly along the length of the web belt 12. The web belt 12 further comprises an attachment mechanism 28 for attaching the lead end 30 of the web belt 12 to the trailing end 32 of the web belt 12. The disk pad 16 comprises a flat disk 34 having a body member engaging surface 36 and an opposed surface 38. A receptacle 40 protrudes outwardly from the opposed surface 38 of the electrode pad disk 34. The cross section of the receptacle element 40 matches the shape of the apertures 26 of the web belt 12 such that the receptacle element 40 can be received within a selected aperture 26. The lead probe assembly 18 includes a probe 50 receivable within a channel 42 of the disk pad 16, a probe support element 52 that is generally aligned with the lead probe 50, a coupling wire 54 that extends from the lead probe 50, and a circular support ring 56.

Hoch fails to teach or suggest electrode feed lines that extend along the belt structure or are integrated within the belt material as recited in claims 1 and 25. At most, Hoch teaches a coupling wire 54 that extends from a lead probe 50 that connects through a support ring 56 to a channel 42 of a disk pad 16. In the present invention, the electrode feed lines are integrated within the belt material as opposed to Hoch, which merely has a lead probe 50 directly connected to a channel 42 of the disk pad 16. Hoch therefore does not deal with the problem of feed lines in a stretchable structure. Hoch fails to lead a person of ordinary skill to solve the

problem of integrating the electrode feed lines within the belt so that the electrode feed lines can be united at a central point in order to establish one or more connection points to an external feed line. There is no suggestion of feed lines in a stretchable belt structure.

According to the invention, the electrode feed lines that are integrated within the belt advantageously allow more electrodes to be easily connected to the belt so that there is an improvement in the imaging and monitoring process. This provides significant advantages for set up and use. The Hoch reference directs the person of ordinary skill toward a different arrangement, which requires each disk pad 16 to be individually connected to the lead probe 50 and placed within the apertures 26. This does not have the set up and use advantages of the claimed structure. As such, Hoch teaches a different approach and does not suggest the features or advantages of the invention.

Hallon et al. discloses an electrode of a multielectrode system 13 that comprises a resilient contact body 1 which is inserted into an electrically conductive tube 2. The contact body 1 is fastened at the lower part of the tube 2 by a thread. A pin 3 of insulating material is inserted into and fixed to the tube 2 at the top. An electric conductor 7 is fixed to the tube 2. Insulating inserts 4 for supporting electrodes are fixed permanently to the elastic holder 6. The elastic holder 6 of the multielectrode 13 is composed of two rubber plates placed one on the other which are fastened by glue. Spaces are provided for passage of conductors 7 leading from individual electrodes. Clamping means 5 are provided on the insulating inserts 4 to secure the position of the electrodes with respect to the elastic holder 6. The holder 6 is provided with a socket 16 connecting all conductors 7 leading from individual electrodes. The socket 16 is

fixed on one side of the multielectrode 13. A fastening belt 8 is provided to maintain the multielectrode on site.

Hallon et al. fails to suggest or provide any motivation to provide electrode feed lines that extend along the belt structure or are integrated within the belt material as recited in claims 1 and 25. In fact, Hallon et al. fails to provide any motivation for a belt that fully surrounds the circumference of a test subject. As shown in Figure 3, Hallon et al. suggests that the multielectrode system merely lays across the chest of a patient. Hallon et al. fails to address the problems the invention addresses. The present invention takes a different approach, by providing an electrode belt that fully surrounds the circumference of a test subject, which advantageously provides more accurate results and a better sample of readings. This also is convenient and efficient as to use and set up. Hallon et al. disadvantageously uses as many as 50 electrodes during operation (Column 2, lines 36-40), which provides for more interference between the electric conductors 7 causing the system to be more susceptible to inaccurate readings. Furthermore, the use of so many electric conductors 7 makes the wires susceptible to kinking and high tensile loads. The present invention provides a plurality of electrode feed lines connected to feed points along the belt material. Such a connection provides the advantage of subjecting the electrode feed lines to less tensile load and provides less interference since the belt is attached with the electrode feed lines integrated within the belt material. The prior art fails to provide such an advantage and fails to disclose such a connection. In fact, Hallon et al. teaches away from the present invention by providing a socket 16 to concentrate all conductors 7 leading from individual electrodes, which disadvantageously

provides a tangled wire mess. In contrast to Hallon et al., the present invention avoids the problem of a tangled wire mess by integrating the electrode feed lines within the belt material. As such, the prior art as a whole teaches a different approach and fails to provide any motivation for the features or advantages of the present invention. Accordingly, Applicant respectfully requests that the Examiner favorably consider claims 1 and 25 and all claims that respectively depend thereon.

Claims 26-27, 29-32, 34, 36, 39, 40 and 43 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hoch in view of Hallon et al., further in view of Akiva (US 6,205,346).

Akiva discloses an electrodes apron for electrocardiogram (ECG) testing having two bracelets for attaching to the arms of the patient. The apron comprises an apron body 1 made from flexible material and two bracelets 7 and 8 on the two sides of the apron for the attachment to the arms of the patient. Electrodes 9, 10, 11, 12, 13, 14, 15, 16 are located within the cast apron. From each electrode emerges a coiled, spiral or zig-zag shaped conductor 17 which is cast within flexible material. The conductors 17 are connected to a connector 18. A multi-pronged cable 19 connects the connector to a standard ECG device.

As previously discussed above, Hoch and Hallon et al. fail to teach or suggest electrode feed lines extending within the electrode holding belt. Akiva fails to provide any motivation to provide the combination of the present invention. In the present invention, electrode feed lines have a length between electrodes that is greater than a length of elastic tubes in a non stretched state. This advantageously provides strain relief for each electrode feed line connecting the

electrodes so that the belt and the electrode feed lines can stretch without ruining the connection between electrodes. In contrast to the present invention, Akiva teaches a different approach by each spiral or zig-zag shaped conductor 17 connecting from an electrode to the connector 18. Akiva disadvantageously teaches that each electrode is individually connected to the connector 18. In contrast to Akiva, the present invention takes a different approach with the electrode feed lines connecting between each electrode. This advantageously allows for a convenient feed in from outside the belt and allows more electrodes to be easily connected in the present invention since each electrode does not have to be wired individually. At most Akira suggests tightening the conductor without causing damage to the conductor, but fails to teach that the conductor 17 extends from one electrode to another. As such, the prior art as a whole teaches a different approach and does not suggest the features or advantages of the present invention. Accordingly, Applicant respectfully requests that the Examiner favorably consider claim 26 and all claims that respectively depend thereon.

Claims 35, 37 and 38 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hoch in view of Hallon et al., further in view of Akiva, and even further in view of Kristbjarnarson et al. (US 6,461,307).

Although Kristbjarnarson et al. teaches a disposable sensor for measuring respiration, the references as a whole fail to suggest the combination of features claimed. Specifically, Hoch and Hallon et al. fail to teach electrode feed lines that extend within the electrode holding belt. The references do not suggest the invention and therefore all claims define over the prior art as a whole.

Claims 41 and 42 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hoch in view of Hallon et al., further in view of Akiva, and even further in view of Atlas (US 6,353,396).

Although Atlas teaches a disposable sensor for measuring respiration, the references as a whole fail to suggest the combination of features claimed. Specifically, Hoch and Hallon et al. fail to teach electrode feed lines that extend within the electrode holding belt. Akiva fails to provide any motivation for providing electrode feed lines to connect one electrode to another. The references do not suggest the invention and therefore all claims define over the prior art as a whole.

Claims 44 and 45 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hoch in view of Hallon et al., further in view of Akiva, and even further in view of Fry et al. (US 4,539,640).

Although Fry et al. teaches a plurality of electrodes arranged in five horizontally spaced rows, the references as a whole fail to suggest the combination of features claimed. Specifically, Fry fails to suggest or teach electrode feed lines being integrated within the belt material or a feed line that connects to the electrode feed lines at one or more feed points along the belt material. The references do not suggest the invention and therefore all claims define over the prior art as a whole.

Claims 46 and 47 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hoch in view of Hallon et al., further in view of Akiva and Fry et al., and even further in view of Asai et al. (US 4,681,118).

As already discussed, Hoch and Hallon et al. do not suggest electrode feed lines that are integrated within the belt. Similarly, as previously discussed, the Fry reference only discloses a plurality of electrodes that are arranged in five horizontally spaced rows, each containing thirty electrodes, in a belt or girdle which may be strapped around the patient's chest, but fails to disclose any of the other features found in the primary reference Hoch. Furthermore, the Asai reference fails to teach or suggest any of the features disclosed in the primary reference of Hoch or any of the limitations as recited in claim 26. As such, these teachings of Hoch, Hallon et al., Fry et al., and Asai et al. suggest a different approach and do not suggest the features or advantages of the invention. Accordingly, Applicant respectfully requests that the Examiner favorably consider claims 46 and 47 in view of the discussion above.

The prior art as a whole fails to direct the person of ordinary skill in the art toward the features of the invention. Further, the invention includes cooperating features which provide particular advantages which are neither taught nor suggested by the prior art. Accordingly, Applicant requests that the Examiner reconsider the rejection in light of the discussion above.

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